

WHAT IS CLAIMED IS:

1. A gear transmission device comprising:
  - a pair of first and second fixed walls, said first and second fixed walls opposing each other with respect to an axial direction of a first gear shaft;
  - a first gear positioned on said first gear shaft between said first and second fixed walls, said first gear being axially moveable with respect to said first and second fixed walls;
  - a vibration-reducing structure having an elastic member being positioned between said first gear and said second fixed wall; and
  - a regulating device for regulating an increase of a bending amount of the elastic member being interposed between the first gear and the second fixed wall by a predetermined value.
2. The gear transmission device according to claim 1, further comprising a second shaft having a relatively large diameter gear on a first end and a relatively small diameter gear on a second end, wherein said small diameter gear operatively engages said first gear positioned on said first gear shaft positioned between said first and second fixed walls.
3. The gear transmission device according to claim 2, further comprising a large diameter ring gear operatively engaged with said first gear, wherein said first gear is an idle gear and said first gear shaft is an idle gear shaft.
4. The gear transmission device according to claim 1, said regulating device including
  - a cylindrical portion being formed on a first opposed end face of the first gear and a planar surface on an end face of the second fixed wall, wherein said elastic member is surrounded by said planar surface and said cylindrical portion; and
  - said cylindrical portion is capable of operative contact with said planar end surface of said second end wall and regulating a bending amount of said elastic member to a predetermined amount.

5. The gear transmission device according to claim 3, said regulating device including

a cylindrical portion being formed on a first opposed end face of the first gear and a planar surface on an end face of the second fixed wall, wherein said elastic member is surrounded by said planar surface and said cylindrical portion; and

said cylindrical portion is capable of operative contact with said planar end surface of said second end wall and regulating a bending amount of said elastic member to a predetermined amount.

6. The gear transmission device according to claim 1, said regulating device including

a cylindrical portion being formed on a first opposed end face of the second end wall and a planar surface on an end face of the first gear, wherein said elastic member is surrounded by said planar surface and said cylindrical portion; and

said cylindrical portion is capable of operative contact with said planar end surface of said first gear and regulating a bending amount of said elastic member to a predetermined amount.

7. The gear transmission device according to claim 2, said regulating device including

a cylindrical portion being formed on a first opposed end face of the second end wall and a planar surface on an end face of the first gear, wherein said elastic member is surrounded by said planar surface and said cylindrical portion; and

said cylindrical portion is capable of operative contact with said planar end surface of said first gear and regulating a bending amount of said elastic member to a predetermined amount.

8. The gear transmission device according to claim 1, wherein said elastic member is a wave washer, a Belleville spring or a rubber washer.

9. The gear transmission device according to claim 8, wherein said elastic member is a wave washer.

10. The gear transmission device according to claim 3, wherein said elastic member is a wave washer, a Belleville spring or a rubber washer.

11. The gear transmission device according to claim 10, wherein said elastic member is a wave washer.

12. The gear transmission device according to claim 5, wherein said elastic member is a wave washer, a Belleville spring or a rubber washer.

13. The gear transmission device according to claim 12, wherein said elastic member is a wave washer.

14. The gear transmission device according to claim 7, wherein said elastic member is a wave washer, a Belleville spring or a rubber washer.

15. The gear transmission device according to claim 14, wherein said elastic member is a wave washer.

16. The gear transmission device according to claim 12, further comprising a plane washer disposed in a position opposite to said cylindrical portion and surrounding said elastic member.